

New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-1

Request:

With respect to the Company's response to DTE 1-2:

- a. please describe what tests will be done during the "testing and commissioning" phase, and
- b. will such tests affect the operation of Salem Harbor Station in any way? If so, please describe in detail.

Response:

- a. Each circuit breaker used to protect NEPs 115kV supply cable and capacitor bank will need to be functionally tested. Each current transformer (CT) and potential transformer (PT) circuit associated with the capacitor bank will receive an acceptance test. The circuits connecting these CTs and PTs to protective relays will require continuity checks. Tests on the CTs will include polarity and burden checks. The bus differential protection circuits associated with each capacitor bank will need to be functionally tested. The capacitor control circuits will be tested from a local and remote stand point. A primary insulation resistance test at 5 kV DC will be performed on the 115 kV cables supplying the capacitor banks. Once all the above testing is complete, a test energization of all the equipment will be performed.
- b. It is not anticipated that the above tests will affect the normal operation of the generating units. To minimize the possibility of an occurrence, NEP will coordinate the switching, testing, and test energization with USGen and Dispatching during these phases of the project.

New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-2

Request:

Please indicate whether the proposed facilities are transmission facilities or distribution facilities.

Response:

The proposed facilities are transmission facilities.

New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-3

Request:

Has NEP identified any other transmission or distribution projects which may need to be constructed at the Salem Harbor site within:

- a. the next 3 years (2007)?
- b. the next 5 years (2009)?
- c. the next 7 years (2011)?

Response:

NEP does not own distribution facilities, but rather transmission facilities. NEP has not identified any other transmission expansion projects which need to be constructed at the Salem Harbor site within any of the three given time frames. However, there may arise a need for some projects relating to maintenance of transmission equipment at the site by 2011. For example, NEP has a 115 kilovolt (kV) underground transmission cable, designated S145 which originates in the Salem Harbor 115 kV switchyard. This cable is 33 years old. Based on age and operating history, NEP will be performing a "remaining life assessment" on the S145 cable. This assessment could result in a decision to "do nothing", to perform life extension construction and/or maintenance, or to replace the cable. NEP expects to perform the "remaining life assessment" for the S145 during 2004.

New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-4

Request:

If the answer to 1-3(a),(b), and/or (c) is yes, please describe what may need to be constructed and why. Please include cost estimates.

Response:

Please refer to the response to USGenNE 1-3.

New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-5

Request:

If, as a hypothetical matter, Salem Harbor Station were retired in its entirety by 2007, would NEP need to construct any additional transmission or distribution facilities for reliability purposes or any other reason:

- a. at the Salem Harbor site?
- b. at another location?

If so, please describe, including cost estimates.

Response:

- a. No additional transmission or distribution projects would be required at the Salem Harbor Site. The "remaining life assessment" for the S145 cable is not related to any hypothetical retirement of the generation of Salem Harbor Station. Rather, the assessment will be performed based on cable age and operating history.
- b. Yes, there would be a need for additional transmission in the North Shore area. Our preliminary planning study indicates a need for the following:
  - reconductoring of three 115 kV lines leaving Ward Hill substation at a combined estimated cost of \$5.4 million
  - expansion of Ward Hill 345 115kV substation by adding three 345 115kV autotransformers with an estimated cost of \$25 million.
  - establishment of a new 345 115 kV substation at Wakefield Junction with an estimated cost of \$14 million.
  - completion of the 345 kV ring bus at Golden Hills substation with an estimated cost of \$2.7 million.

New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-6

Request:

Has NEP discussed with the ISO staff or NEPOOL committees additional facilities NEP may need to locate at the Salem Harbor site between now and 2011? If so, please describe those facilities and why they may be needed. Please include cost estimates.

Response:

No, NEP has not had such discussions with ISO staff or NEPOOL committees.

New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-7

Request:

Is NEP willing to abide by all of the site conditions imposed on USGenNE by the City of Salem Planning Board in its Decision dated December 18, 2003? If not, why not?.

Response:

USGenNE obtained site plan approval for a \$175,000,000 project that requires significant modification to the existing generating plant. This work is expected to take two years with a steady, daily work force of 25 to 40 workers. In addition USGenNE expects that during 6 months of the 24 month project, the work will require approximately 150 workers entering and exiting the site each day. Due to the work force traffic and equipment deliveries of this project, USGenNE has agreed to police details at the intersection of Derby/Webb Street throughout the duration of the project, to re-pave some city streets curb to curb and even deliver some of the larger pieces of equipment by barge. The size of the equipment for USGenNE's project requires pile driving and its associated noise. Lighting is proposed that may impact the neighborhood and may need yet unknown mitigation to be approved by the City Planner at a future date. In addition there are some impacts from this extensive project that USGenNE and the Salem Planning Board could not properly define and agreed to a \$1,000,000 impact fee to be paid to the City by USGenNE.

In comparison NEP is proposing a \$1,800,000 project to install two capacitor bank units at its substation. Capacitor banks are common pieces of equipment installed at many of NEP's substations. The work will be accomplished with a labor force of 5 to 10 workers (an average of 8) spread over a 9-month period. There will be few equipment deliveries, the largest of which are the capacitor units that fit on a standard flat bed truck. Pile driving is not required for the small capacitor bank foundations. Most of the work involves wiring of the capacitor banks into the existing substation equipment.

In the interest of costs to customers and project simplicity, it would not be appropriate for NEP to adhere to conditions developed for a project that has a scope and impact vastly different from its own.

New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

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New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-8

Request:

If NEP were unable to obtain the necessary permits to expand the Ward Hill substation, what alternatives would NEP pursue and how would they affect the need for the capacitor banks at Salem Harbor? Please provide all work papers and analyses which support your response.

Response:

NEP objects to this Information Request on the ground that it seeks information beyond the scope of this proceeding.

New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-9

Request:

With respect to the Company's response to DTE-1-10, please explain why the Company chose to use the lagging reactive capabilities of the four Salem Harbor units reported in the NEPOOL NX-12D forms?

Response:

The NX-12D was the best data available to the Company at the time of the analysis.

Prepared by or under the supervision of: John W. Martin, P.E.

New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-10

Request:

With respect to the Company's response to DTE-1-10, if "peak load" is the condition assumed in its analysis, why wouldn't the Company expect that the lagging reactive capabilities of the Salem Harbor units reported on NEPOOL Operating Procedure No. 12 be available?

Response:

Please refer to the response to USGenNE 1-9. The Company was not aware the values had changed. Also, with regard to NEPOOL OP 12, only the values at "claimed capability" are reported. There is no information in OP 12 with respect to reactive capability at less than claimed capability.

New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-11

Request:

With respect to the Company's response to DTE-1-10, please provide the date or dates within the last five years when one or more of Salem Harbor Station's units were "backed down" due to insufficient lagging reactive support.

Response:

No dates were found where any of the units' MW generation was backed down to produce more MVar.

New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-12

Request:

If the Company's response to USGenNE-1-11 is "there were no such dates", please provide the technical basis for the Company's statement that "Based on these values it is clear that the Salem Harbor generators could not provide enough reactive support if unit 4 were not running."

Response:

Without the contribution from unit 4, the data in table contained in response to DTE-1-10 added up to less than the required 126 MVar at Normal Claimed Capability.

New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-13

Request:

With respect to the Company's response to DTE-1-10, please indicate the total number of MWs a single unit at Salem Harbor would need to be "backed down" to achieve the stated goal of achieving 135 MV ars of reactive support.

Response:

The goal is 126 MVAR at a nominal 115 kV. From the table in DTE-1-10, without unit 4 there are only 111 MVAR available at Normal Claimed Capability. This is a deficit of 15 MVAR. Backing down Salem unit 1 from its normal claimed capability to "Half Load" would provide the required 15 MVAR additional. From our data, the difference between Normal Claimed Capability and Half Load would be approximately 30 MW.

New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-14

Request:

Please describe in detail how NEP will guarantee the following will not occur:

- a. voltage transients at the capacitor switchyard and in the switchyard at Salem Harbor, including phase-to-ground overvoltages, phase-to-phase overvoltages, and overvoltages due to voltage magnification.
- b. Impacts on power quality for customers with sensitive loads due to variations in voltage when energizing the capacitor bank(s).

Response:

- a. NEP plans to conduct a study of voltage transients which will check for such problems and include recommendations from such study in our equipment selection during detailed design.
- b. The Company's Transmission Planning Guide, submitted as Attachment A to DTE 1-7, requires that the variation of voltage on the switching of reactive sources be no more than 2.5%. See page C-7, Table 3 of the Transmission Planning Guide.

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New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-15

Request:

Please identify the location of other capacitor banks sited as close to a generating unit as in the instant case. Please provide the approximate nominal rating of any such unit(s).

Response:

Due to the confidential nature of data regarding market-competitive generators, NEP limits this answer to information about its system and USGenNE interconnections to it. In both of the following examples, NEP and USGenNE have, respectively, capacitor banks and generation stations in close proximity.

1. At the NEP Franklin Square / Manchester St substation in Providence, RI, there is a 115 kV 63 MVar capacitor bank connected to the 115 kV bus to which three 125 MVA units owned by USGenNE (Manchester St units 9A, 10A, and 11A) connect.
2. At the New England Electric Transmission Comerford No. 18 Substation / HVDC terminal in Monroe, NH, there are two 63 MVar and four 32 MVar capacitor banks connected by two ½-mile long lines to the 230 kV busses to which four 39 MVA units, owned by USGen, are connected.



New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Prepared by or under the supervision of: John W. Martin, P.E.

New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-16

Request:

Does the proximity of a generating unit to a capacitor bank decrease the effectiveness of the capacitor bank? Please provide any technical data or reports on which the Company's response is based.

Response:

The proximity of a generating unit to a capacitor bank does not necessarily decrease the effectiveness of the capacitor bank. However, if the generating unit were attempting to hold a voltage level lower than that which the capacitor bank by itself would provide, then the generating unit would produce "leading" MVAR which would in effect act to cancel some of the MVAR from the capacitor bank, absorbing them from the system. If the absorbed MVAR were to get too high, the bank could be switched off, provided the unit could hold the desired voltage by itself. However, voltage schedules and reactive device dispatch is coordinated by ISO-NE and the satellite control centers including REMVEC.

This response is based on my 20 plus years experience in running load flows.

New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-17

Request:

Please describe how the proposed capacitor bank can provide leading reactive capability (as opposed to lagging reactive capability). If it cannot, how does NEP propose to provide leading reactive capability at the Salem Harbor site?

Response:

A capacitor, by the nature of its stored electrical charge, produces leading reactive power. It supports voltage on a power system by doing so.

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New England Power Company  
Docket No. D.T.E. 03-128  
Responses to USGenNE's First Set of Information Requests

Information Request USGenNE 1-18

Request:

With respect to exhibits JWM-3 and JWM-4, please identify the year or years in which the relationships shown would first occur.

Response:

The analysis which produced the curves in JWM-3 and JWM-4 was based on a model of what the North Shore transmission system is expected to look like in 2006.